

REMARKS

Claims 1-8, all the claims pending in the application, stand rejected. Applicant has cancelled claims 1 and 2 and has replaced them with new claim 9, which is drafted in accordance with U.S. practice and contains limitations that Applicant respectfully submits will overcome the prior art rejection. Claim 3 is amended to depend from new claim 9. The remaining claims 4-8 have minor amendments to correct language informalities. New claims 10 and 11 are added.

Notably, in all of the claims, the reference to "electrode and ultraviolet radiation" has been changed to "ultra violet band C radiation" in order to better focus the claimed invention on the disclosed embodiment. Specific reference to this limitation can be found in Fig. 3 (UVC electrode) and the text in the specification at page 9, where the beneficial effects of radiation at about 253.7 nm (well known to be within the C band) in killing bacterium, viruses, mildew, etc, are explained. No new matter is added.

Claim Rejections - 35 U.S.C. § 112

Claims 1-8 are rejected as failing to define the invention in the manner required by 35 U.S.C. § 112, second paragraph. The Examiner finds the claims to be narrative in form, replete with indefinite and functional or operational language, and inconsistent with the requirement of U.S. practice that the claims shall be a single sentence. This rejection is traversed for at least the following reasons.

Claims 1-2 are canceled and restructured as new claim 9, which overcomes the recited bases for rejection.

Further, claims 3-8 are amended to present the additional structural components as affirmative limitations.

Reconsideration of this basis for rejection is respectfully requested.

Claim 1 is rejected under 35 U.S.C. § 112, second paragraph as being indefinite. The Examiner objects to the term "nearly" as being a relative term. This rejection is moot in view of the cancellation of claim 1.

Claim 2 is rejected under 35 U.S.C. § 112, second paragraph as being indefinite. The Examiner notes that the limitations "the front and back block walls" has insufficient antecedent basis. This rejection is moot in view of the cancellation of claim 2.

Claim 3 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner notes that the limitation "the lower end" and "the upper end" have insufficient antecedent basis. This rejection is overcome by the amendment to claim 3.

Claims 5-8 are rejected under 35 U.S.C. §.112, second paragraph, as being indefinite. The Examiner notes that each of these claims recites a limitation "the direct current (DC) inputs" and finds insufficient antecedent basis for this limitation. This rejection is overcome by the amendment to these claims.

Claim Rejections - 35 U.S.C. § 103

Claims 1 and 2 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hak (6,494,940) in view of Yuen (GB 2301179) and Pick et al (5,330,722). This rejection is moot in view of the cancellation of claims 1 and 2. Substitute claim 9 is patentable over the combination of references.

Hak

The Examiner looks to Hak for a teaching of a portable air cleaner comprising a housing (12) having an inlet (36) and an outlet (37), and extractor fan (78) drawing air into inlet (36) through an ultraviolet radiation tube (86) and out of the housing through air outlet (37). The Examiner further finds a circuit (162) as claimed, with reference to col. 8, lines 49-63. The Examiner notes that the circuit is connected to and controlling the radiation tube (86), as illustrated in Fig. 7. The Examiner further finds a switch (168) on housing (112) with a plug (178) and electric cord (176) to receive electricity. As described at col. 6, lines 66 - col. 7, line 35, the C-band UV light source 86 (see col. 6, line 66-col. 7, line 14) is provided with a shield 102 that keeps the radiation from extending beyond the housing. The UV radiation tube (86) is fixed at the outlet grill 106 of the air cleaner, which is placed on the housing 12, as illustrated in Figs. 7 and 8.

The Examiner admits that Hak fails to teach a portable air cleaner comprising (1) a body that is semicircle in shape, (2) a circuit board, (3) a cathode high voltage discharge fiber line fixed at the air outlet and (4) an extractor fan fixed between the ultraviolet lamp and the air outlet.

Yuen et al

The Examiner looks to Yuen et al for an air cleaner having a pyramidal shape and comprising internally a transformer (44), a circuit board (42), an extreme ultraviolet ray tube (32) and a cathode high voltage discharge fiber thread (40) for further ionizing contaminants in the air (page 5, lines 25-27). The Examiner admits that the structure in Yuen is not semi-circular, but asserts that it does teach in Fig. 2 an outlet on a front side of the pyramid having a grill 14 that contains a carbon fiber thread 40 and a grill 30 with filter 28 on the rear side of the pyramid, as well as a switch 52 that is mounted on the side of the pyramid. Further, a base 22 with a plug 46 and a circuit board 42 mounted with transformer 44 mounted thereon is also contained within the unit. A UV ray tube 232 is disposed at the center of the air collecting device, as illustrated in Fig. 2 and disclosed at page 4, line 8 - page 5, line 27. However, there is no mention in the reference of the range of UV radiation that is used.

The Examiner notes that this reference teaches that it is well known to place the extractor fan between the outlet and the ultraviolet radiation source and also that it is well known to use a disk charge fiber line fixed to the air outlet to further ionize an air stream. The Examiner finds it obvious to modify the purifier of Hak and include the noted missing features, on the basis of the teachings of Yuen et al. The Examiner finds it would have been obvious to replace the control system of Hak with the circuit board of Yuen et al and to shift the location of the fan from one side of the ultraviolet lamp (the inlet side) to the outlet side of the lamp because the fan will function exactly the same "to pull air into the air purifier and then blow the air out of the purifier after it has been treated."

In addition, the Examiner asserts at page 7 of the Office Action that the claimed air collector is met by the light chamber 18 and is composed of a space defined by an air collecting wall (next to the UV lamp) and a blocking wall (light shield 102), where the ultraviolet lamp is fixed between the air collecting wall and the blocking wall, as illustrated in Figs. 7 and 8.

Pick et al

Finally, the Examiner notes that Pick et al discloses a germicidal air purification device having a housing that is semicircular in shape, as illustrated in Figs. 1 and 6. The Examiner finds

it to be an obvious matter of design choice to make the device semicircular, as taught by Pick et al.

In traversing this rejection with respect to new claim 9, Applicant note that the body is now defined as having a continuous semicircular shape including a front, top and rear portion. This structure is distinguished from the prior art, which shows only a substantial rectangular-shaped body and does not have both inlet and outlet portions in curved front end and rear surfaces of the body. Moreover, Applicant submits that placement of the fan at the outlet side of the ultraviolet light is significant in that it prevents contamination of the fan since the air is drawn past the light before entering the fan. Further, Applicant submits that the disposition of the partition wall 28 and air collector 25 permits air to efficiently flow around the tube 21 without interference from the fan, prior to being blown to the outlet grill having the carbon fiber line 12. This offers a highly efficient and effective structure.

Further, new claim 10 has been added which defines the fan 10 and tube 21 as being disposed at an angle to the horizontal base of the structure, as illustrated in Fig. 2. This permits a more compact design and desirable exit angle for the air as it is blown into a room.

Claim 1 is rejection under 35 U.S.C. § 103(a) as being unpatentable over Pick et al in view of Yuen et al. This rejection is moot in view of the cancellation of claim 1

As to claim 9, the claimed invention distinguishes over the prior art for at least the following reasons.

The Examiner finds in Pick et al the claimed housing (22), extractor fan (42), transformer (78), power supply (82), ultraviolet radiation tube (34), air inlet (24), outlet (24), with an arrangement of components substantially as claimed, based on the illustrations in Figs. 1, 2 and 6. The Examiner admits that Pick et al fails to teach a portable air cleaner comprising a cathode high voltage discharge fiber line fixed to an air outlet.

The Examiner looks to Yuen et al for such teaching in an environment where similar components are used in an air filter. The Examiner notes that Yuen is relied upon to teach that it is well known to use a discharge fiber line fixed to an air outlet to further ionize in their stream and further to use a circuit board to hold the component for supply and power to the fan, ultraviolet radiation source and fiber discharge line.

On the basis of the content of independent claim 9, this rejection is overcome because of structural limitations as outlined above.

Claim 4 is rejected under 35 U.S.C. §103(a) as being unpatentable over Hak in view of Yuen et al and Pick et al, as applied to claim 1, and further in view of Cartellone (5,837,020) and Bullard (2,085,249). This rejection is traversed for at least the following reasons.

The Examiner admits that Hak in view of Yuen and Pick et al fail to specifically teach a portable device that includes a movable handle and movable gallus fixed to the body of the device by a buckle.

The Examiner looks to Cartellone for the disclosure of a portable air room cleaner (10) that includes a handle (154), where the handle is movable based on a pivot in a handle mount 156 on the top section 106, as illustrated in Fig. 1 and explained col. 2, lines 9-16.

The Examiner looks to Bullard for a portable air respirator apparatus where shoulder straps 7 and away strap 6 may be used with suitable buckles (8) to permit mounting of the air purifier on the body of a user, as explained at col. 1, line 55 of Bullard.

However, Applicant respectfully submits that these structures are not relevant to a semicircular body, as claimed. Applicant submits that the semicircular structure creates unique problems that may be solved only by the structure defined in the rejected claim. Thus, in the absence of some teaching or suggestion for modification of Hak in view of Yuen et al, Pick et al, Cartellone et al and Bullard, the claims should be patentable.

Claims 3 and 5-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hak in view of Yuen et al, Pick et al, Cartellone, and Bullard, as applied to claims 1, 2 and 4, and further in view of Sham et al (6,464,760). This rejection is traversed for at least the following reasons.

In the rejection at page 11 of the Office Action, the Examiner notes that Hak in view of Yuen et al and Pick et al fails to teach batteries used to power a device instead of a conventional AC power source, such as power from a power cord 46. The Examiner looks to Sham et al for the disclosure of an apparatus for purifying air by exposing an air stream from a surrounding area

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to ultraviolet radiation. The Examiner finds that the unit could be operated from storage batteries rather than an AC source.

As to claim 3, Applicant would rely upon the patentability of the parent claim 9 for patentability of this dependent claim.

With regard to claims 5-8, the Examiner notes that Sham et al discloses an apparatus for purifying air by exposing an air stream from a surrounding area to ultraviolet radiation. Sham is also relied upon for a teaching of a free standing, self-contained unit powered from a conventional AC source or storage batteries, which has a high efficiency air purification and sanitization using relative short air flow, as explained at col. 1, lines 34-51. The Examiner relies upon Sham et al to teach that it is well known to substitute a conventional AC source of power with a DC source of power such as storage batteries. The Examiner asserts it would have been obvious to combine the references to make a storage device that is portable.

Again, this set of claims would be patentable for the reasons given with respect to the parent claims. Sham et al does not remedy these deficiencies.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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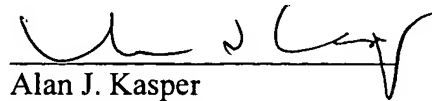
WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: April 24, 2006

Respectfully submitted,



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